

## Section 2-9: Combined and Joint Variation

**Warm-up:** Solve for  $k$ .

1.  $53 = \frac{k(2)(2)^2}{10}$

2.  $80 = \frac{k(3)(2)^2}{10}$

3.  $107 = \frac{k(4)(2)^2}{10}$

4.  $132.5 = \frac{k(5)(2)^2}{10}$

*Question:* What do you notice about the 4 warm-up problems? What does it mean?

*Combined Variation:*

*Example 1:* A baseball pitcher's ERA varies directly as the number of earned runs allowed and inversely as the number of innings pitched. Write a model for the situation.

*Question:* How do you find  $k$  in a combined variation problem?

*Example 2:* Matt Mitarnowski had an ERA of 2.56, having given up 72 earned runs in 253 innings. How many earned runs would he have given up if he had pitched 300 innings if his ERA was the same?

*Joint Variation:*

*Question:* How do you find  $k$  in a joint variation problem?

*Example 3:* The power in an electric circuit varies jointly as the square of the current and the resistance. The power is 1500 watts when the current is 15 amps and the resistance is 10 ohms. Find the power when the current is 20 amps and the resistance is 21 ohms.

*Homework:*

**“Hold yourself responsible for a higher standard than anyone else expects of you. Never excuse yourself.” - Henry Ward Beecher**